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ABSTRACT

This report explains the growing evidence that investments in teacher knowledge are among the most productive means for increasing student learning. The creation of rigorous professional standards for teachers is one sign of progress in this area. However, new teaching standards will have little import for students, particularly the most vulnerable ones, if school districts continue to hire teachers who are unprepared and assign many teachers outside their fields of expertise. The report discusses whether it is possible to raise standards and have enough teachers. It describes recruitment initiatives to address the problems of teacher supply, demand, and the need to achieve greater equity in all students' access to high-quality teaching. It also examines variations in standards across states and discusses what states and school districts can do to raise teacher standards while equalizing teacher salaries, establish license reciprocity across states, and expand teacher education programs in high-needs fields. The report offers action steps for governors and state legislators as well as state boards of education, state education agencies, and professional standards boards. An appendix presents the basis for cost and attrition estimates. (Contains 10 charts and 28 references.) (SM)

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SOLVING THE DILEMMAS OF TEACHER SUPPLY, DEMAND, AND STANDARDS:

How We Can Ensure a Competent, Caring, and Qualified Teacher for Every Child

LINDA DARLING-HAMMOND

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The National Commission on Teaching & America's Future was created in 1994 to identify the implications for teaching embodied in current school reforms; to examine what steps need to be taken to guarantee all children access to skilled, knowledgeable, and committed teachers; and to develop a comprehensive blueprint for recruiting, preparing, and supporting a teaching force that can meet 21st-century standards of high educational performance. The Commission issued its major report, *What Matters Most: Teaching for America's Future*, in September of 1996. One year later, the Commission released an anniversary report, *Doing What Matters Most: Investing in Quality Teaching*, which describes progress toward its recommendations.

The Commission has been supported by grants from the Rockefeller Foundation; Carnegie Corporation of New York; the Ford Foundation; the DeWitt Wallace-Reader's Digest Fund; the AT&T Foundation; the BellSouth Foundation; the Goldman Sachs Foundation; the William R. Kenan Jr. Charitable Trust; the Philip Morris Companies Inc.; the National Institute on Educational Governance, Finance, Policymaking, and Management of the U.S. Department of Education Office of Educational Research and Improvement; and the National Partnership for Excellence and Accountability in Teaching.

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SOLVING THE DILEMMAS OF TEACHER SUPPLY, DEMAND, AND STANDARDS:

How We Can Ensure a Competent, Caring, and Qualified Teacher for Every Child

LINDA DARLING-HAMMOND

National Commission on
Teaching & America's Future

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Introduction

Every September, parents ask the same important questions. Who is teaching my child? Will my child's teacher inspire her? Will he look after her individual needs? Will the teacher help my child learn all the necessary basic skills, as well as how to think and solve problems in the years ahead? Will my child's teacher be deeply knowledgeable about the subjects she teaches and about the children she teaches as well?

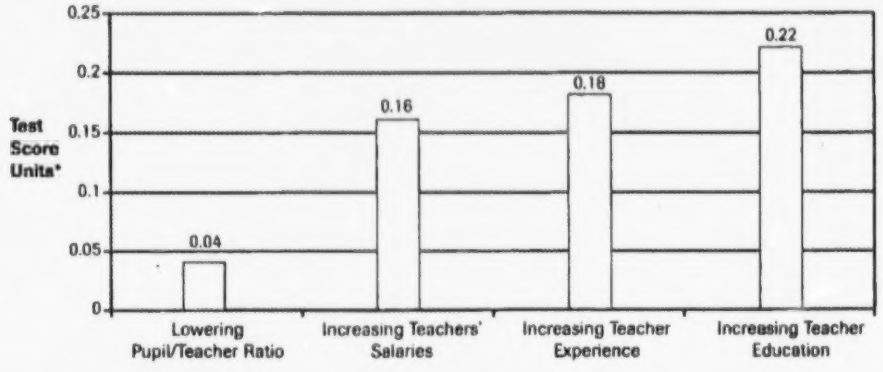
Much progress has been made over the past few years toward answering these questions in the affirmative. There is growing recognition that investments in teacher knowledge are among the most productive means for increasing student learning (see Chart 1). However, much more work needs to be done. More parents need to demand that their children and other children are taught by well-prepared and well-qualified teachers. More business leaders need to demand that schools invest in teacher development, just as they invest in their own employees. More policy makers need to make quality teaching and the recruitment of well-prepared teachers their number one education priority. More teachers and administrators need actively to support lifelong learning for all members of the education profession.

The creation of more rigorous professional standards for teachers is one sign of progress. These include standards that ensure that teachers will know the subjects they teach and how to teach them to children; that they will understand how children learn and what to do when they are having difficulty; and that they will be able to use effective teaching methods for those who are learning easily as well as for those who have special needs.

CHART 1

EFFECTS OF EDUCATIONAL INVESTMENTS

SIZE OF INCREASE IN STUDENT ACHIEVEMENT
FOR EVERY $500 SPENT ON:



*Achievement gains were calculated as standard deviation units on a range of achievement tests in the studies reviewed.

Source: Rob Greenwald, Larry V. Hedges, & Richard D. Laine (1996). The Effects of School Resources on Student Achievement. *Review of Educational Research,* 66 (3). pp. 361-396.

2

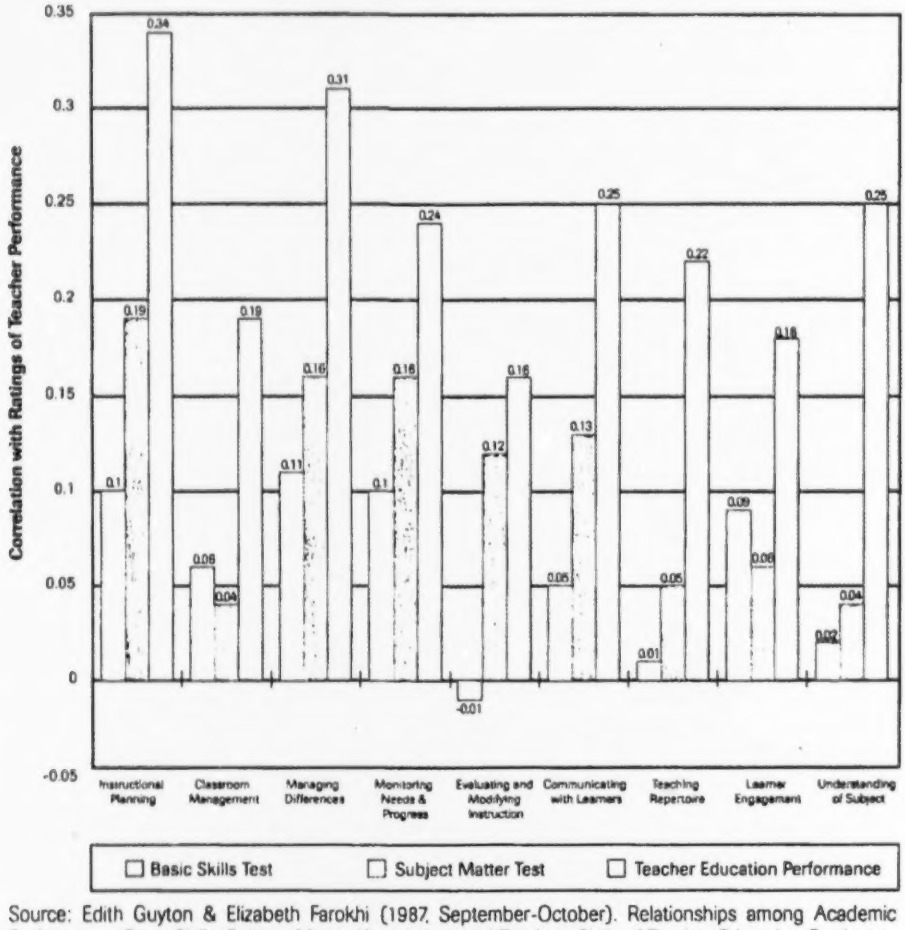
These standards include those of the National Board for Professional Teaching Standards (National Board or NBPTS), which has developed challenging examinations to document and recognize accomplished teaching in veteran teachers, and related standards of the Interstate New Teacher Assessment and Support Consortium (INTASC), a group of more than 30 states that has banded together to create more rigorous licensing standards and assessments for beginning teachers.

The national accrediting body for teacher education, the National Council for Accreditation of Teacher Education (NCATE), has incorporated both of these sets of standards into its framework for evaluating teacher education programs. This means that accredited programs must now demonstrate that they prepare teachers with deep knowledge of the content areas they teach and with solid understanding of learning, teaching, curriculum, assessment, and the uses of technology, among other things.

As Chart 2 illustrates, knowledge of subject matter and, especially, the knowledge of teaching and learning acquired in teacher education are strongly correlated with teacher performance in the classroom. Thus, standards that strengthen teacher knowledge are likely to make a substantial difference for the quality of teaching.

CHART 2

RELATIONSHIP BETWEEN BASIC SKILLS, SUBJECT MATTER KNOWLEDGE, TEACHING KNOWLEDGE, AND TEACHER PERFORMANCE



Source: Edith Guyton & Elizabeth Farokhi (1987, September-October). Relationships among Academic Performance, Basic Skills, Subject Matter Knowledge, and Teaching Skills of Teacher Education Graduates. *Journal of Teacher Education*, 38 (5), pp. 37-42.

While new teaching standards may hold great possibilities for raising the quality of teacher preparation, these advances will have little import for students—and especially the nation's most vulnerable children—if school districts continue to hire teachers who are unprepared and to assign many teachers outside of their field of expertise. These decisions have decidedly negative effects on student learning, especially as content expectations grow more challenging. Students learn significantly less from teachers who are not prepared in their teaching area (see Chart 3). Furthermore, the uphill climb to staff the nation's schools with qualified teachers is made that much steeper if new teachers leave

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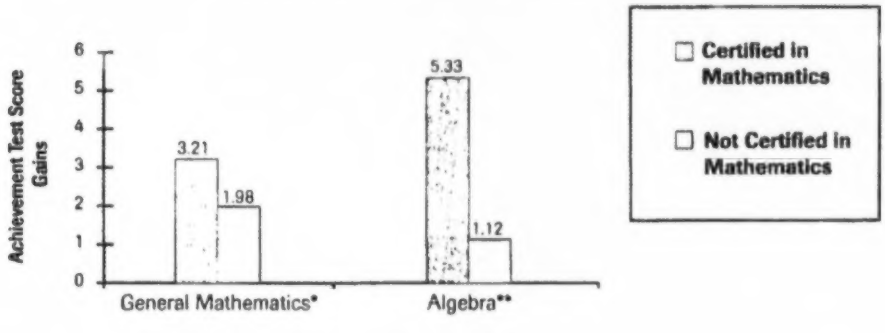
in large numbers in the face of difficult conditions and few supports. Although many affluent districts have long waiting lists of extremely well-qualified teachers, in central cities and poor rural areas disparities in salaries and working conditions make teacher recruitment more difficult, and many schools hire individuals who are seriously underprepared for their work. And many governments continue to lower or eliminate standards for entry rather than create incentives that will attract an adequate supply of teachers to the places they are needed. To achieve the educational goals we hold for all children, policy makers must proactively develop strategies that do not trade off student learning against haphazard teacher hiring.

CHART 3

EFFECTS ON STUDENT ACHIEVEMENT OF TEACHER CERTIFICATION IN MATHEMATICS



ANOVA results: * $p < .01$ ** $p < .001$

Source: Parmalee P. Hawk, Charles R. Coble, & Melvin Swanson (1985, May-June). Certification: It Does Matter. *Journal of Teacher Education*, 36 (3), pp. 13-15.

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Can we raise standards and have enough teachers too?

A legitimate question can be raised as to whether improving standards for teachers will create teacher shortages. Is it really possible both to require more extensive training and to encourage enough people to enter and remain in teaching, especially at a time of growing demand? In an historical analysis, Michael Sedlak and Steven Schlossman found that the answer has tended to be "yes." They note:

> Contrary to what many modern-day educators tend to assume, teacher shortages have been commonplace throughout the twentieth century. Not only has the raising of standards not exacerbated teacher shortages, it may even—at least where accompanied by significant increases in teachers' salaries—have helped to alleviate them (and, at the same time, enhanced popular respect for teaching as a profession). (Sedlak and Schlossman, p. 39)

In the current context, the answer to this question depends on a range of policies currently in place and yet to be adopted by federal, state, and local education agencies. There is substantial evidence in states and districts that pay attention to teaching quality, as well as in other countries that have highly developed systems of teacher recruitment and support, that it is quite possible to create an adequate supply of teachers while simultaneously ensuring that they are well prepared to teach.

What is the prognosis? There is no doubt that demand for teachers will continue to increase over the next decade. Growing enrollments of students caused by increased birth rates and immigration, coupled with a large wave of retirements and turnover of younger teachers, have created the largest growth in the demand for teachers in America's history. The most well-reasoned estimates place the total demand for new entrants to teaching at 2 million to 2.5 million between 1998 and 2008, averaging over 200,000 annually. About half of these are likely to be newly prepared teachers, and about half will be migrants or returnees from the reserve pool of teachers.

Although the recruitment challenge is sizable, it is not at all impossible. In fact, the number of new teachers currently prepared each year is more than enough to satisfy this demand. Despite reports of shortages in some areas, the United States annually produces many more new teachers than its schools hire. Only about 60% of newly prepared teachers enter teaching jobs right after they graduate, and many report that they cannot find jobs. The American Association for Employment in Education (AAEE, 1997) reports surpluses of teachers in most fields in the Northwest, Rocky Mountain, Northeast, and Middle Atlantic states alongside shortages of teachers in most fields in Alaska and a noticeable number of fields in the West and South.

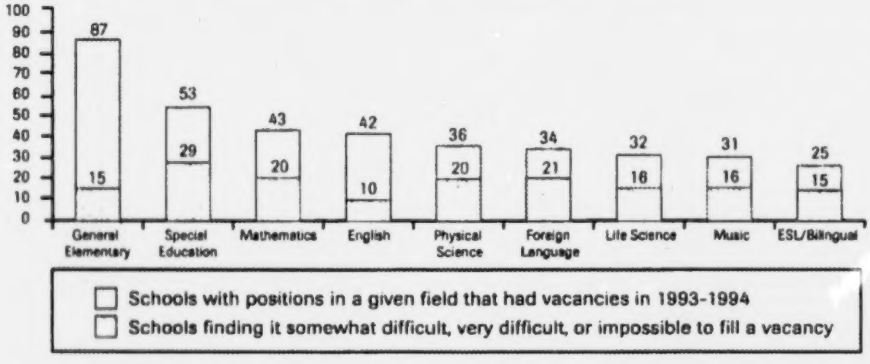
In its annual studies, AAEE finds that elementary education has been a field of national surplus for a number of years, along with fields like English, art, business education, health education, physical education, and social studies. On the other hand, fields like mathematics, physical science, special education, and bilingual education register mild to serious levels of shortage across different regions of the county. Difficulties are most common in inner cities and in the rapidly growing South and West. These distributional problems create apparent shortfalls in specific fields and locations. Chart 4 shows the differences that occur in hiring across fields.

Spot shortages occur in part because some states prepare relatively few teachers but have rapidly growing student enrollments. For example, by the year 2007, enrollments are projected to increase by more than 20% in California and Nevada and by more than 10% in many states in the West and South. However, enrollment declines are anticipated in most parts of the Northeast and Midwest, while other states will have stable enrollments. At the same time, some states have a large number of teacher education institutions and regularly produce more teachers than they can hire, while others have little infrastructure for preparing teachers and may not have developed aggressive recruitment strategies or reciprocity arrangements for accepting licenses awarded in other states. As a result, it is difficult to get teachers from where they are prepared to where they are needed. These distributional problems—

CHART 4

DIFFICULTY IN FILLING TEACHING VACANCIES

(PERCENT OF SCHOOLS WITH TEACHING VACANCIES, BY FIELD, AND PERCENT THAT FOUND THEM DIFFICULT TO FILL)



Source: National Center for Education Statistics (1997). *America's Teachers: Profile of a Profession, 1993-94.* Tables A8.11a-e.

remnants of a long-ago age when teacher labor markets were local—create most of the apparent shortages of teachers. In addition, smaller than desired applicant pools occur in some communities due to inequalities in salaries and working conditions across states and districts, inattention to planning and recruitment, inadequate national and regional information about vacancies, and inadequate incentives for recruiting teachers to the fields and locations where they are most needed.

Some states and districts create their own shortages. The National Commission on Teaching & America's Future found that the hiring of underqualified teachers in many communities was less a function of labor market shortages than it was of cumbersome hiring procedures that chase away good candidates and prevent efficient and timely hiring. Before its overhaul in recent years, the 62-step hiring process in Fairfax County, Virginia mirrored those of many other large districts that have plenty of qualified applicants but a bureaucracy that cannot find a way to hire them. A process that takes months to conduct discourages qualified applicants who are unwilling to wait and often results in the late hiring of much less-qualified candidates. Similarly, many states enforce redundant requirements for fully qualified and credentialed candidates from other states, making it difficult for them to enter the local teaching force. For example, districts in Massachusetts cannot hire entering teachers who have met certification standards in other states—including rigorous tests of basic skills, subject matter, and teaching knowledge—until after they have passed Massachusetts' own test, which is not offered at all during the peak summer hiring months. By the time the test is offered in October,

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the school year has long since begun and potential entrants from other states have often decided to go elsewhere or have been lost to other occupations.

Other barriers include late budget decisions on the part of state and local governments and teacher transfer provisions that push new hiring decisions into August or September, lack of pension portability across states, and loss of salary credit for teachers who move. Unfortunately, it is also still the case that some districts engage in patronage hiring and that others would rather hire an untrained teacher who costs less than a well-qualified teacher with greater education and experience.

Slipshod Recruitment

Sabrina Vaught was shocked by what she learned about teacher hiring in her first teaching stint. Sabrina entered Teach for America (TFA) after a year of teaching high school English in Korea. She had hoped to teach high school in a high-need area, but was placed in a Louisiana elementary school. Sabrina was appalled to learn, after the fact, that the TFA interviewer had decided she should not teach high school because of her "petite frame and high-pitched voice" and that the district personnel director selected her to teach kindergarten "because I looked from my picture like I would be a good kindergarten teacher."

Vaught was troubled about going into an elementary classroom after only a few weeks of training. But, she says, "I'd promised to do this. I was still under the impression that there was a classroom of kids that wasn't going to have a teacher and they were waiting for me, and if I didn't go they would have subs that would change every two days."

Within two months, Sabrina had decided to leave teaching and enter a school of education. "I had a lot of kids who were frustrated and I was frustrated because I wanted to help them and didn't have the training to do that." A car accident clinched her decision. Before leaving, however, she met an experienced, certified teacher whom she learned had initially applied for her job. Sabrina was amazed by what she found. "Here we were supposed to be teaching in shortage areas, and this woman had ten years of teaching experience in elementary education. Of course she was going to cost several thousand dollars more a year so they didn't hire her. She went to teach in the [all-white] private school," while Sabrina was hired to teach in the nearly all-black public school. When Sabrina left, her principal hired a certified replacement that afternoon. "That was troubling to me, too," Sabrina confessed, "because then I thought, 'What was I doing?'" She had never imagined that "teacher shortages are defined by money, rather than by lack of qualified people."

However, in some fields like mathematics, physical science, special education, and bilingual education, real shortfalls do exist, largely because the knowledge and skills required by teachers command much greater compensation in fields outside of teaching and because there are inadequate numbers of slots in schools of education to prepare an adequate supply of teachers in these fields. Unlike medicine, where the federal government helps to offset shortages by

funding needed training slots in medical schools and scholarships for candidates in shortage fields, there is no current national policy to help manage the labor force in teaching. Policies that helped to ameliorate teacher shortages in the 1960s and 1970s were rescinded in the early 1980s and have not yet been replaced.

Swimming Upstream in New York City: What Did It Take to Get Hired?

"It was the most insensitive, discouraging, incomprehensible process I have ever experienced," says Lori Chajet of her yearlong quest to get a teaching job in New York City several years ago. It was only because she was extraordinarily persevering that Chajet, a Brown University graduate with a master's in education from Teachers College, Columbia University, survived the bureaucratic obstacle course that defeated many others.

Despite the fact that New York had continuing high demand for teachers and frequent shortages, well-prepared teachers were discouraged from applying for jobs before the reforms that began to transform the system in 1997. (See page 27.) Chajet was advised to start the process of getting a file number even before she started her preparation program. Then followed countless attempts to speak to someone at the New York City Board of Education by phone, waiting weeks just to receive the wrong forms, and several hour-long train trips to Brooklyn to hand-deliver documents. Just getting a file number required five different processes—initial check-in and registration, fingerprinting, a physical checkup, a transcript review, and an oral interview—some requiring separate processing fees payable only by individual postal money orders.

This experience was shared by most recruits studied by New York's Education Priorities Panel, which recommended after its two-year study that the city hiring system be scrapped. "I had to file the same exact papers four times," reported one teacher. "They'd send me letters that something wasn't right and I'd have to go back in person." Another reported, "I've had my fingerprints taken five times and paid for it each time. What do they do with those records? I took the TPD [Temporary Per Diem] test for regular education and special education. I took the NTE [National Teachers Examination] and passed all three parts. I took all my education credits. What does it take to be a teacher?" The panel found that fewer than 10% of the city's new teachers actually made it through the certification process without difficulty.

Chajet persevered through similar travails—including the inexplicable return, after three months, of her unprocessed application for a license—only to find that she would not even know what vacancies were available until late August. "I was stunned. I couldn't believe that this was the process that they expected all beginning teachers to go through—a whole summer of not knowing to just start teaching in a whole new environment as the kids arrive. How could I spend the summer planning and preparing without knowing who and where I'd be teaching?"

By this time Chajet, an Ivy League graduate with a master's degree, felt that her chances of teaching were as good as the next person on the street. Finally after a long roller coaster ride of a summer, she landed a job from a school that she had visited earlier in the spring—though not without additional paperwork and trips to the Board of Education and the local district office to become officially hired. She recalls one of these visits when after waiting in line she was told, "I'm sorry, you're just not important enough right now." Chajet

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feels much more appreciated now that she is a full-time teacher, but notes that the daily demands of classroom teaching are nothing compared with the frustrations of the hiring process she went through.

Not everyone was able to endure that process. When Harvard graduate Tracy Seckler, also armed with a master's degree in teaching from Columbia, sent out dozens of letters and résumés to New York City schools in April, she found that she would have to wait until after Labor Day even to learn of vacancies. Determined to teach, she felt she had to look elsewhere. Outside the bureaucratic entanglements of New York City, she found personalized treatment, well-organized early hiring procedures, and attention to teacher quality in affluent, suburban Scarsdale, New York. "While I was getting busy phone signals from the New York City Board of Education," Seckler recalls, "Scarsdale's personnel office was calling me with different possibilities for scheduling an interview." She was impressed that teachers, parents, and principals participated in her interview, and that she was asked insightful questions about teaching and her philosophy of education rather than about course credits and money orders.

Of her move to Scarsdale, Seckler says, "I never intended to teach anyplace other than New York, but the possibility of beginning teaching with no opportunity to visit the school, see the kids, or talk with the teachers began to look completely unappealing." In May, while Chajet was still waiting in line at the New York City Board of Education, Seckler was offered a job teaching kindergarten for the following year. By June she was meeting with her future colleagues and planning with excitement for her first class of students.

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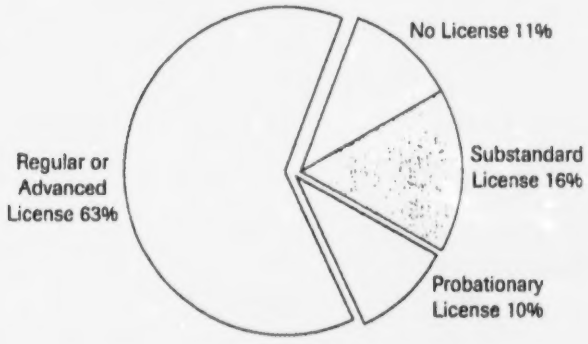
Finally, the continued high attrition rate of beginning teachers creates ongoing pressure for hiring. With nearly 30% of new teachers leaving within five years of entry and even higher attrition rates in the most disadvantaged districts that offer fewest supports, a revolving door of candidates makes recruitment a Sisyphean task in states and districts that have not enacted mentoring programs for beginning teachers.

As a consequence of all of these factors, large numbers of underprepared teachers are hired each year. As demonstrated in Chart 5, in 1994, 27% of all new entrants to teaching had no license or a substandard license in the field they were hired to teach, indicating that they lacked one or more of the subject matter or education requirements for a license in the state in which they were hired. A disproportionate number of these individuals were assigned to teach the most vulnerable students in the lowest-income schools. This number is substantially larger than a decade earlier, due to rising demand with few policies in place to manage supply. Depending on how states and districts manage recruitment, and on the policies that are enacted in the coming years, the number of underprepared entrants could grow substantially larger or smaller.

CHART 5

LICENSE STATUS OF NEWLY HIRED* PUBLIC SCHOOL TEACHERS, 1993-1994



**Newly hired teachers* include all those hired by schools in 1993-94, excluding those who moved or transferred from one school to another.

A substandard license is an emergency, temporary, provisional, or alternative license issued to someone who has not met the requirements for a standard license.

A probationary license is a license issued to a new teacher who has met all requirements and is completing an initial probationary period.

Source: Tabulations conducted by Richard Ingersoll for the National Commission on Teaching & America's Future from data contained in the NCES's Schools and Staffing Surveys, 1990-91 and 1993-94, *Public School Teacher Questionnaires*.

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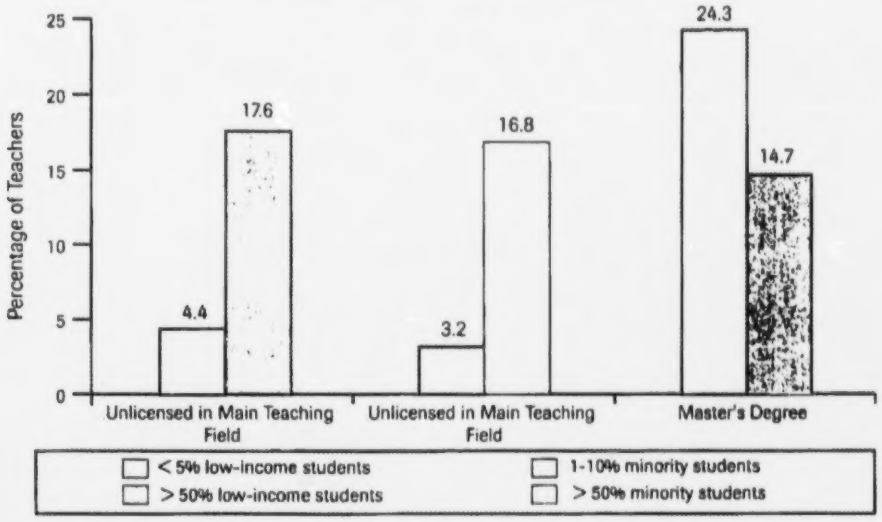
It is also true that standards can be uncomfortable—especially if they count—because they highlight shortcomings in current policies and practice, and meeting them requires change. Thus, it is often the case that as standards are raised, loopholes are created. This has occurred in a number of states: As some have raised licensing standards, they have simultaneously created loopholes in the form of temporary or alternative routes that allow many candidates to avoid meeting the new standards. In virtually every case, the less-prepared candidates are hired to teach to the least advantaged students, thus denying those students the benefits of the intended reforms. Chart 6 illustrates how low-income and minority children are typically the most greatly affected by policymakers' willingness to lower standards.

Similar efforts to avoid the discomforts of change associated with higher standards have occurred with regard to teacher education accreditation. As NCATE has raised its standards, alternative accreditation proposals have been put forward to allow schools to continue to practice with the imprimatur of accreditation, without having to meet external, rigorous, profession-wide standards.

CHART 6

QUALIFICATIONS OF NEWLY HIRED TEACHERS,*
BY SCHOOL TYPE, 1994



* Newly hired teachers excluding transfers.

Source: Tabulations conducted by the National Commission on Teaching & America's Future from data contained in the NCES *Schools and Staffing Survey*, 1993-1994.

On the other hand, some states have simultaneously enacted incentives and created development opportunities while raising standards, thus enhancing the quality of practice and equality of opportunity across the board. For example, more than ten states have enacted rigorous and thoughtful teacher education and licensing standards and yet do not hire any teachers on emergency certificates. States and communities that have succeeded in raising standards and expanding learning opportunities for all teachers and their students have equalized resources for teachers' salaries and have created proactive recruitment and induction systems with appropriate incentives and supports for teaching in high-need areas.

A key question is whether other states and communities are willing to invest in these kinds of strategies in lieu of lowering standards for the teachers of the most vulnerable and least powerful students.

Variations in standards across states

espite evidence that student learning depends substantially on what teachers know and can do (for a review, see *Doing What Matters Most: Investing in Quality Teaching*), states differ greatly in the extent to which they invest in teachers' learning as a key policy lever. At the front end of the career, there is extremely wide variation in the standards to which entering teachers and teacher education institutions are held. Licensing standards are noticeably different from state to state. Some high-standards states require a college major in the subject to be taught, plus intensive preparation for teaching—including well-defined studies of learning and teaching, and a semester or more of student teaching. Some low-standards states require less than a minor in the field to be taught, only a handful of education courses, and little guided practice.

In Wisconsin or Minnesota, for example, a prospective high school teacher must complete a bachelor's degree that includes a full major in the subject area to be taught, plus coursework covering learning theory, child and adolescent development, subject matter teaching methods, curriculum, effective teaching strategies, uses of technology, classroom management, behavior and motivation, human relations, and the education of students with special needs. In the course of this work, she must complete at least 18 weeks of student teaching in Wisconsin—in Minnesota, at least a college semester—under the supervision of a cooperating teacher who meets minimum standards. In Minnesota, this experience must include work in a multicultural

setting and with special needs students. If a teacher is asked to teach outside the field of her major for part of the day, she must already be licensed with at least a minor in that field, and can receive a temporary license in the new field only briefly while completing a major. By contrast, in Louisiana, a prospective high school teacher could be licensed without even a minor in the field she was going to teach. The state would not require her to have studied curriculum, teaching strategies, classroom management, uses of technology, or the needs of special education students, and she could receive a license with only six weeks of student teaching.

In addition to differences in the standards themselves, there are great differences in the extent to which they are enforced. Whereas some states do not allow districts to hire unqualified teachers (and others, like Missouri, use state salary funds only for the hiring of certified teachers), others routinely allow the hiring of candidates who have not met their standards, even when qualified teachers are available. In Wisconsin and 11 other states, for example, no new elementary or secondary teachers were hired without a license in their field in 1994. By contrast, in Louisiana, 31% of new entrants were unlicensed and another 15% were hired on substandard licenses. At least six other states allowed 20% or more of new public school teachers to be hired without a license in their field. Because of these differences in licensing standards and enforcement, more than 80% of high school teachers of academic courses in Wisconsin and Minnesota have fully met state licensing requirements and have at least a college major in the field they teach. The comparable proportion in Louisiana is only 64%. Not surprisingly, students in Minnesota and Wisconsin achieve at the top of the distribution on national assessments, while those in Louisiana score at the bottom.

More than 30 states allow teachers to be hired on temporary or emergency licenses without having completed preparation or having met other licensing requirements. During the late 1980s and early 1990s, at least 50,000 emergency or substandard licenses were issued annually by states. Even the rigor of these restricted licenses varies. States like Minnesota will issue a restricted license only to a teacher who has already been fully prepared in a teaching field but who needs to complete additional coursework in order to enter from out of state or switch to a new field or teaching level. Such a license is good for one year only, while the necessary coursework is completed. Others, like Louisiana and Texas, will issue an emergency license to a person who does not even hold a bachelor's degree, and will renew it for several years while the candidate makes little progress toward becoming licensed.

States also differ greatly in the levels of funding they allocate to preservice and inservice teacher education, the standards they apply to teacher education

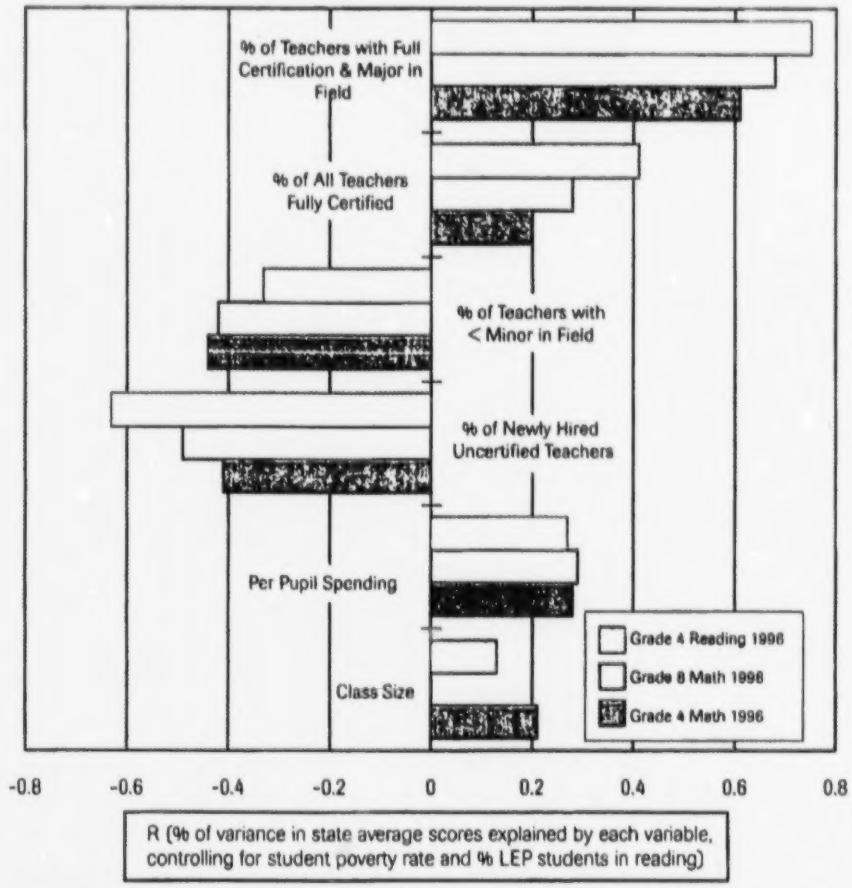
institutions and to schools, the types and extent of professional learning opportunities and the incentives for professional study they make available to educators, and the extent to which they require or fund induction supports for beginning teachers. As some examples of these differences, in 1997 only three states—Arkansas, North Carolina, and West Virginia—required professional accreditation for schools of education, and only nine funded induction programs that provided a structured program of mentoring for beginning teachers, including trained, state-funded mentors. Student teaching requirements ranged from five weeks in Massachusetts to 18 weeks in Wisconsin.

Whereas 12 states required a major in the field to be taught in addition to education training, nearly as many did not require even a minor in the subject area for prospective teachers. As of 1994, the proportions of mathematics teachers teaching with less than a minor in the field ranged from less than 10% in Missouri to more than 55% in Alaska. Similarly, the proportions of academic high school teachers teaching with both a license and a major in their field ranged from a low of 52% in Alaska to more than 80% in Iowa, Minnesota, Montana, New Hampshire, North Dakota, and Wisconsin—all states that routinely score near the very top of the distribution on rankings of student achievement in reading and mathematics on the National Assessment of Educational Progress (NAEP). This means that a student in one state might have only a 50/50 chance of being taught by a teacher who is well prepared in his field, while in another state, nearly all students are guaranteed a fully prepared teacher.

In every category of possible investment in teachers' knowledge and in every area in which standards for teaching are set (e.g., licensing, accreditation, advanced certification, and on-the-job evaluation), there are substantial differences in the policies and practices employed by states, and these differences influence what students learn. In fact, one recent analysis found that, after controlling for student characteristics like poverty and language status, the strongest predictor of state-level student achievement in reading and mathematics on the NAEP was each state's proportion of well-qualified teachers (as defined by the proportion with full certification and a major in the field they teach) (see Chart 7). A strong negative predictor of student achievement was the proportion of teachers on emergency certificates (Darling-Hammond, 2000). This is not surprising, given the substantial evidence that teachers without preparation for teaching are generally rated more poorly and produce lower levels of student learning than those who have had the opportunity to learn how to teach. It is common sense that if all students can learn, surely all teachers can, too. Thus, effective long-term solutions to the problems of teacher supply rest on strategies that prepare teachers well.

CHART 7

VARIANCE IN NAEP STUDENT ACHIEVEMENT SCORES EXPLAINED BY SELECTED RESOURCES


% of Teachers with Full Certification & Major in Field
% of All Teachers Fully Certified
% of Teachers with < Minor in Field
% of Newly Hired Uncertified Teachers
Per Pupil Spending
Class Size
Grade 4 Reading 1998
Grade 8 Math 1998
Grade 4 Math 1998
-0.8
-0.6
-0.4
-0.2
0
0.2
0.4
0.6
0.8
R (% of variance in state average scores explained by each variable, controlling for student poverty rate and % LEP students in reading)

Source: Linda Darling-Hammond (2000). *Teacher Quality and Student Achievement*. Seattle: Center for the Study of Teaching and Policy, University of Washington.

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What can states and school districts do?

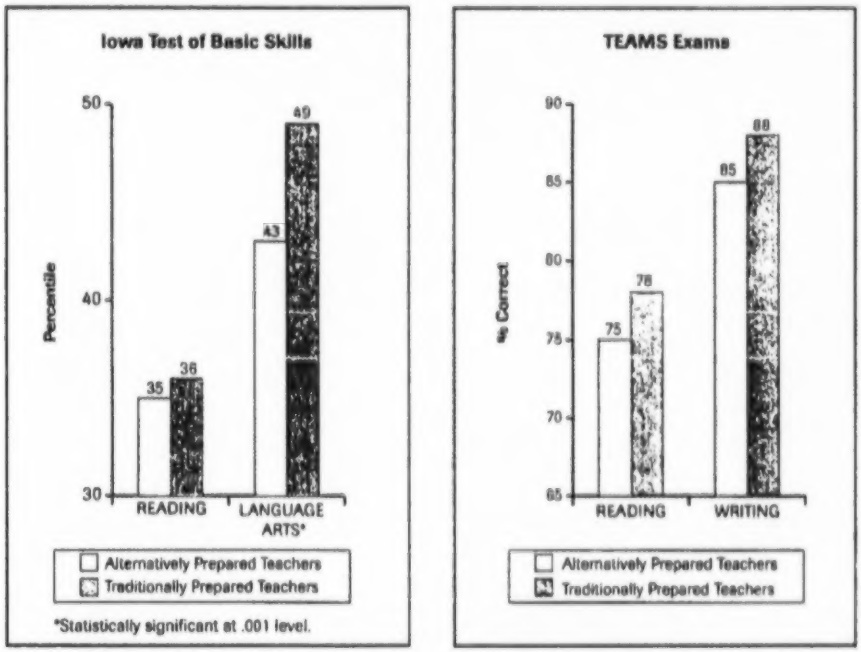
Sometimes states and districts respond to shortfalls in their hiring pools by creating back-door routes into teaching or short-term training programs that provide only a few weeks of preparation before placement in a classroom as teacher of record. Ironically, these strategies exacerbate the problems of supply and demand rather than solve them. In addition to the fact that the students of these teachers learn less than those taught by traditionally prepared teachers (see Chart 8), evaluations of truncated alternative certification programs have found that about 60% of individuals who enter teaching through such programs leave the profession by their third year, as compared to about 30% of traditionally trained teachers and only about 10 to 15% of teachers prepared in extended, five-year teacher education programs.

These different attrition rates compound the differences in initial rates of entry into teaching for these different pathways. Taking into account the costs to states, universities, and school districts of preparation, recruitment, induction, and replacement due to attrition, the actual cost of preparing career teachers in the more intensive five-year programs is actually significantly less than that of preparing a greater number of teachers in shorter-term programs who are less likely to stay—and, not incidentally, are also less successful in the classroom (see Chart 9).

CHART 8

STUDENT ACHIEVEMENT OF ALTERNATIVELY AND TRADITIONALLY PREPARED TEACHERS

(AFTER ADJUSTING FOR ENTRY LEVEL)



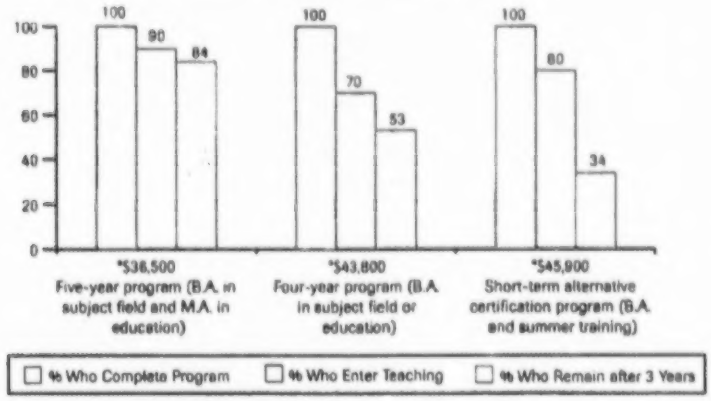
Source: D. Gomez & R. Grobe (1990). Three Years of Alternative Certification in Dallas: Where Are We? Paper presented at the annual meeting of the American Educational Research Association, March 1990.

Fortunately, many states and districts have developed practical, effective solutions to the problems of teacher supply, demand, and quality. Among the approaches with the greatest potential for addressing supply imbalances and achieving greater equity in students' access to high-quality teachers are the following, offered in a David Letterman-style Top Ten List for states and school districts to consider:

10. Raise teacher standards while equalizing teacher salaries. Many states that have successfully eliminated shortages and improved teacher quality have linked increases in salaries to increases in standards. For example: Connecticut's 1986 Education Enhancement Act created a minimum beginning teacher salary level and offered state funds to districts on an equalizing basis (i.e., lower-wealth districts received more help than wealthier districts) to reach that target. Meanwhile, standards for licensing were strengthened with more rigorous requirements for teacher education, carefully designed teacher licensing examinations, and a beginning teacher internship and assessment

CHART 9

AVERAGE RETENTION RATES FOR DIFFERENT PATHWAYS INTO TEACHING



*Estimated Cost Per Third-Year Teacher

Estimates based on costs of teacher preparation, recruitment, induction, and replacement due to attrition. See Appendix A, Basis for Cost and Attrition Estimates.

program. Within three years, Connecticut's cities went from having shortages to having surpluses of teachers, and the quality of teacher preparation and practice rose steadily, along with levels of student achievement. During subsequent years, Connecticut's student achievement rose to the top of the national distribution in both reading and mathematics. 19

9. Establish licensing reciprocity across states. If states begin to use common standards and high-quality assessments like those developed by INTASC, this would enable new and veteran teachers in states with surpluses (e.g., Connecticut, Maine, Minnesota, Wisconsin, and others) to move more easily to states that experience shortfalls (e.g., Alaska, California, Texas, and Florida). More than 30 states have now adopted the INTASC standards and nearly that many are piloting new assessments of teaching knowledge and skill through the INTASC state consortium. With more portable licenses, states that currently have shortages can take advantage of the fact that 60,000 newly prepared teachers each year do not find jobs in the states where they prepared to teach, and many veteran teachers leave the profession when they move because license incompatibilities are too costly and time-consuming to overcome.

8. Grant licenses to out-of-state entrants who have achieved National Board Certification. National Board Certification—like board certification in medicine, architecture, and accounting—is granted only to highly accomplished teachers who have demonstrated their ability on rigorous assessments. More than 20 states have enacted rules granting a license to any teacher who

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has met the National Board's standards. With about 160,000 public school teachers across the nation who have engaged in professional development to prepare them for National Board Certification and the prospect of 100,000 National Board Certified teachers by the year 2006, such policies would help create a national labor market of excellent teachers and provide incentives for others to develop their skills by pursuing National Board Certification.

7. Create national recruitment initiatives, streamline hiring procedures, and develop on-line information technologies. When new teachers are graduating from college and veteran teachers are anticipating a move, they must scout out teaching vacancies by calling innumerable district offices and school buildings—one by one—often with no readily available information about what parts of the country, much less individual schools, have vacancies in their field. A national electronic clearinghouse would contribute greatly to the ability of districts to advertise their vacancies and candidates to find them. At the local level, on-line information systems for hiring—like those instituted by New Haven Unified School District in California (Snyder, 1999) and Fairfax, Virginia (NCTAF, 1996)—are crucial for reaching potential teachers and for managing their applications in a timely, efficient way. Rather than trading calls with overtaxed personnel officers, standing in line, or being put on hold, candidates who want to teach in these districts can gain access to information about the specifics of vacancies over the Internet, apply by e-mail, be interviewed by video conference if necessary, have their credentials evaluated by state and local officials, and receive an answer from the district within days rather than months of application. Because personnel functions have been streamlined and are supported with up-to-date technology, school personnel can manage a quick-response information system rather than thousands of individual file folders that must be passed around, are easily lost, and require enormous quantities of clerical time to maintain. Communication between school-level managers and candidates is also facilitated by readily available two-way information about the characteristics of vacancies and candidates. Not surprisingly, districts that are able to recruit aggressively and hire top candidates quickly and professionally do not suffer the shortages experienced by districts only a few miles away.

6. Create service scholarship programs to prepare high-ability candidates in shortage fields. Research has found that scholarship programs that function like forgivable loans have been very successful in getting fully prepared candidates into high-need fields and high-need locations in professions like medicine as well as teaching. One of the most successful state programs is the North Carolina Teaching Fellows, which fully underwrites the college education of hundreds of high-ability students annually. These students receive special supports as they prepare to teach, and they commit to teaching

for at least four years in North Carolina public schools. This program has increased the supply of male and minority teachers as well as individuals in shortage fields like mathematics and science. Evaluations show that the fellows are pleased with their preparation and are evaluated highly by local school principals. California's recently expanded Cal T grants for teacher education candidates and APLE loans (forgivable over a four-year period) have shown that they can produce results quickly when used for recruiting candidates through graduate-level credential programs, which are the norm in California. There, candidates can be encouraged to enter teaching by having their training subsidized and can prepare to teach in only a year or two.

5. Expand teacher education programs in high-need fields. Currently, the funding of teacher education seats is not driven by the need for teachers in particular fields. While there are surpluses of candidates in elementary education, English, and social studies in many states, for example, there are inadequate numbers of teacher training slots in high-need areas like mathematics, physical science, special education, and English as a Second Language. Targeted incentives from federal and state governments to expand the number of slots offered in shortage fields would ensure that there are programs available for candidates to attend. There is substantial precedent for this in the medical field, where the federal government subsidizes the creation and expansion of training programs to increase the supply of physicians in high-need areas. During the 1960s and 1970s, the federal government sponsored a number of programs that accomplished similar goals in teaching, including training grants to colleges and universities and subsidies for candidates in fields like mathematics and science. The National Defense and Education Act and legislation that supported the National Science Foundation's teacher training initiatives, the training of special education teachers, the Urban Teacher Corps, and other initiatives to recruit and prepare teachers successfully eliminated shortages while the programs were in operation.

4. Provide incentives for the establishment of more extended (e.g., five-year and fifth-year) teacher education programs. Studies have found that teachers prepared in extended teacher education programs enter and remain in teaching at higher rates than teachers in traditional four-year programs, and remain at much higher rates than those prepared in short-term, alternative certification programs. It is likely that it is partly the year-long student teaching experience connected to coursework on teaching methods and student learning that contributes to this outcome, since teachers feel much better prepared as a result of the longer, better integrated approach to clinical training. The National Commission on Teaching estimated that, based on the number of teachers remaining in the field after three years, it actually costs substantially less to prepare a candidate in an extended program than it does to

prepare candidates in shorter programs who leave much sooner. States that want to develop a stable, high-quality teaching force can invest their training resources more wisely by emphasizing program models that prepare effective, career teachers.

3. Provide incentives for community college/college pathways that prepare paraprofessionals for certification. Another high-yield source of teacher supply, especially of minority teachers, is the pool of current paraprofessionals who are not yet in college. These teaching assistants often live in the communities where they work and know the students' languages and cultures. A number of successful programs now exist to help these individuals, who are already committed to education, complete their undergraduate education and certification requirements in a streamlined, supported fashion through pathways that take advantage of both community colleges and universities working in partnership. Studies show that such programs have a very high yield in terms of the numbers of participants who complete the program and enter teaching (Recruiting New Teachers, 1996).

2. Create high-quality induction programs for beginning teachers. Beginning teachers who have access to intensive mentoring by expert colleagues are much less likely to leave teaching in the early years. A number of districts, like Cincinnati, Columbus, and Toledo, Ohio and Rochester, New York, have reduced attrition rates of beginning teachers by more than two-thirds (often from levels exceeding 30% to rates of under 5%) by providing expert mentors with release time to coach beginners in their first year on the job. These young teachers not only stay in the profession at higher rates but become competent more quickly than those who must learn by trial and error.

Promoting Improvement and Removing Incompetent Teachers through Peer Assistance and Review

> *I think [there was] a generation of people who didn't have anyone there to help them when they walked in the door. They went into their room and shut the door. And every year some kids would come through, and however they [taught], that was what was done. The bottom line is, children come first. We are here for the children. We're professional educators and are here to teach children. That is a driving factor of the Peer Assistance and Evaluation Program.*
>
> *Carolyn Nellon, Peer Review Panel,*
> *Director of Human Resources, Cincinnati Public Schools*

Although many claim that it is impossible to truly evaluate teachers or get rid of those who are incompetent, a growing number of districts are transforming old, nonfunctional systems of teacher evaluation into peer review systems that improve teaching performance and counsel out those who should not be in the profession. Peer review and assistance

programs initiated by AFT and NEA locals in Toledo, Cincinnati, and Columbus, Ohio; Rochester, New York; and Seattle, Washington have been successful in helping beginners learn to teach and in helping veterans who are having difficulty to improve their teaching or leave the classroom without union grievances or delays.

Each program was established through collective bargaining and is governed by a panel of seven to ten teachers and administrators. The governing panel selects consulting teachers through a rigorous evaluation process that examines teaching skills and mentoring abilities. The panel also approves assignments of tenured teachers who are having difficulty to intervention status (through self-referral or referral made by principals) and oversees appraisals of intern and intervention teachers.

In each case, standards for gaining tenure and remaining in teaching have been significantly raised by the peer assistance program. Part of the programs' success is the development of more useful measures to replace what Rochester's Tom Gillett calls "drive-by, observation-based checklists." In Rochester, all teachers must participate in a review every third year, choosing colleagues or administrators to examine data on their performance, including information about student learning as well as practice.

Another success factor is the intensive assistance provided by consulting teachers who are freed up to focus on this job. This ensures that adequate help and documentation will occur over the course of the year. A third factor is the expertise of the consulting teacher, who is selected for teaching excellence and who generally is matched by subject area and grade level with the teacher being helped. This increases the value of the advice offered and the credibility of the judgment rendered.

In each city, more teachers have been given help and have made major improvements in their teaching *and* more teachers have been dismissed than ever had occurred under the old systems of administrative review. In Toledo and Cincinnati, roughly one-third of the teachers referred to intervention each year have left teaching by the end of the year through resignation, retirement, or dismissal. In Columbus, about 144 teachers (approximately 2% of the teaching force) were assigned to intervention over an eight-year period. Of those, about 20% retired or resigned. The others have improved substantially: During the first five years in Cincinnati, 61% of teacher dismissals for performance reasons resulted from peer review, as compared with 39% from evaluation by administrators. Five percent of beginning teachers under peer review were dismissed, as compared with 1.6% of those evaluated by principals. Of 60 Rochester teachers assigned to the Intervention Program since 1988, about 10% determined through their work with lead teacher mentors that they should leave the profession. Rochester teachers may voluntarily request the assistance of a lead teacher mentor through the Professional Support Program, which has served about 100 teachers since 1991.

When teachers take on the task of professional accountability, it not only improves instruction but it profoundly changes the roles of teachers' unions.

"We can't legitimately protect teachers who are not performing," says Denise Hewitt, director of Cincinnati's Peer Review Panel. At the same time, the improvements in teaching can sometimes be striking. According to Cincinnati consulting teacher Jim Byerly, "We had a teacher who was in intervention 10 years ago, who had considerable skills and experience but she had gotten lazy. She needed to start planning the lessons and stick to them and do the hands-on stuff that was needed. Her final appraisal was strong, better than average. I think she felt empowered by the outcome. She went on to be a lead teacher."

1. "Just say no" to hiring unqualified teachers. School districts often have disincentives to hire qualified teachers or have inadequate systems for doing so. On the financial side, some districts refuse to hire more experienced, qualified teachers who cost more when they can hire less expensive, unqualified teachers. Some let go of large numbers of qualified teachers in early retirement buyouts to reduce salary costs, and then hire unqualified new teachers. Many have cumbersome, nonautomated hiring procedures with built-in delays that make early, efficient hiring almost impossible, thus losing qualified candidates. Some prefer to hire patronage candidates rather than qualified teachers. States that do not allow the hiring of unqualified teachers have careful management systems and legislated incentives to ensure a highly qualified teaching force. Among these are policies that allow salary reimbursements only for qualified teachers; require districts to hire qualified teachers who have applied or to reassign other fully certified teachers not currently in classrooms before hiring less-qualified teachers; and require specific procedures for recruiting and advertising before an uncertified teacher can be hired. In addition, states can provide assistance for districts to automate and streamline their personnel functions to facilitate early, efficient identification and hiring of qualified personnel. School districts can expand their outreach, create partnerships with local universities for preparation and hiring, increase the efficiency of their hiring procedures, change internal policies that prevent early hiring, and devote more resources to the personnel function. Efforts to do all of these things helped New York City reduce its hiring of unqualified teachers from 4500 candidates early in the 1990s to less than one-third that number by 1997, with the goal of continuing progress toward ensuring all children access to well-qualified teachers.

Recruiting the Best in New York City

Local school districts and teacher education programs are redoubling their efforts to solve the persistent problems of teacher recruitment and preparation. One remarkable example of progress can be seen in New York City, highlighted in the Commission's report in 1996 for its difficulties in recruiting qualified teachers. The Big Apple, which has struggled for years with cumbersome and dysfunctional hiring procedures that have led to the hiring of thousands of uncertified teachers annually, has made a commitment to placing a qualified teacher in every classroom. With a set of wide-ranging efforts by its personnel department, New York had come much closer to achieving its goal by the opening of school in 1997, when two-thirds of its 5500 vacancies were filled with fully qualified teachers, as compared to one-third of a smaller number in 1992.

Key to this success is a series of efforts that bring the city's recruiters directly to students in local preparation programs each spring; offer interview and tests on-site at college campuses; recruit teachers in high-need areas like bilingual and special education through scholarships, forgivable loans, and strategically located recruitment fairs; work with universities and local districts to bring well-trained prospective teachers into hard-to-staff schools as student teachers, interns, and visitors; make offers to well-qualified candidates

much earlier in the year; and streamline the exchange of information and the processing of applications. More efforts are underway to create automated systems for projecting vacancies and processing information, decentralize interviews to principals and committees of teachers in local schools, and strengthen partnerships with local colleges. With expansion of these efforts, the city hopes it will soon fill all of its vacancies with competent, caring, well-qualified teachers.

States and communities that have chosen to invest in the recruitment, support, and retention of well-prepared teachers in all schools have been able to pursue excellence and equity in tandem. These efforts appear to have substantial payoff. With carefully crafted policies that rest upon professional standards, invest in serious preparation, and make access to knowledge a priority for all teachers, it is possible to imagine a day when each student will, in fact, have a competent, caring, and qualified teacher working in a school organized to support his or her success.

Action Steps

For any wide-scale reforms to succeed, there must be a congruence of effort. What goes on in classrooms between teachers and students may be the core of education, but it is profoundly shaped by what parents and principals do and by what superintendents, school boards, chief state school officers, state boards of education, governors, and legislatures decide. If the actions of federal and state governments do not support the work of local school districts, and if school districts do not support the work of schools, very little of worth can be accomplished. When various parts of the system are working at cross purposes, the enterprise lurches around like a carriage pulled by horses running off in different directions.

State and local education leaders are the gatekeepers. They can use policies to encourage highly qualified people to enter teaching careers, assure quality in teacher preparation programs, and set high standards for licensing and certification. State and local leaders also can develop policies that reduce, even eliminate, inequities in access to quality teaching. They can direct resources to professional development and reward excellence in teaching. Governors and state legislators, state boards of education, state education agencies, professional standards boards, state and local school board members, superintendents, teachers' unions, colleges and universities, subject matter associations, parents, community members, and business leaders all have a role to play.

Governors and State Legislators

Increase the ability of financially disadvantaged school districts to pay for qualified teachers by raising and equalizing beginning salaries and providing incentives (ranging from financial stipends to improved working conditions) for teachers to move to shortage areas. Then insist that school districts hire only qualified teachers.

- Make timely decisions about school budgets so that districts can recruit and hire qualified candidates in the spring of each year.
- Remove barriers to entry by ensuring pension portability, salary credit for experience, and acceptance of National Board Certification as a portable license.
- Provide incentives such as service scholarships and forgivable loans for teacher candidates who prepare to teach in high-need fields (e.g., mathematics, science, special education) and hard-to-staff locations (e.g., inner-city or rural schools).
- Fund the development of high-quality pathways to teaching, including extended teacher preparation programs that include a year-long internship in a professional development school, and post-graduate (MAT) options for mid-career changers, paraprofessionals already in the classroom, and military and government retirees.
- Create mentoring programs for first-year teachers to reduce attrition and enhance competence.

State Boards of Education, State Education Agencies, and Professional Standards Boards

Establish rigorous standards for teacher education and licensing that are linked to student standards, so that teachers are prepared to teach in ways that will enable students to learn as the new standards demand.

- Support the creation of high-quality pathways into teaching for undergraduates, post-graduates, and paraprofessionals that meet rigorous accreditation standards. Then eliminate emergency, temporary, and alternative certificates that lower standards for teacher knowledge and skill.
- Conduct demographic studies that provide projections of anticipated teacher supply and demand by field and location, and design policies—including scholarships and training grants in high-need, fields and locations—to alleviate shortfalls before they become severe.

- Base teacher licensing on demonstrated performance including assessments of subject matter knowledge, teaching knowledge, and teaching skill that measure the INTASC standards. Then work with other states to establish reciprocity in licensing.
- Design mentoring programs that provide sustained support to beginning teachers and evaluate their teaching skills prior to granting a long-term professional license.

Local School Boards and Superintendents

Design budgets, recruitment supports, and hiring policies that allow the system and individual schools to: 1) know by early spring how many teachers can be hired; 2) engage in national outreach using on-line technologies and information clearinghouses; and 3) evaluate and hire qualified applicants efficiently and quickly.

- Work with universities to create seamless transitions between teacher preparation, hiring, and ongoing professional development. Create partnerships with local colleges to develop preparation programs that include yearlong clinical training in professional development schools, pathways into teaching for paraprofessionals and mid-career changers in addition to college students, and supported internships for beginning teachers.

- End the practice of assigning the most inexperienced teachers to teach the most disadvantaged students with the heaviest loads and fewest supports. Place beginning teachers in professional practice schools, with reduced teaching loads and under the supervision of mentors.
- End the practice of hiring underqualified teachers and placing teachers out-of-field by: 1) aggressive recruiting and timely hiring of qualified teachers; 2) partnerships with universities for training candidates in high-need fields; 3) hiring bonuses for teachers in high-need fields; 4) salary benefits for teachers who pursue a second license in a high-need field; 5) retraining of teachers to teach in high-need fields; and 6) reassignment to classroom teaching of certified personnel in high-need fields who have left the classroom for other positions.

Colleges and Universities

Work with state and local education agencies to identify fields of high demand and expand preparation programs in these fields.

- Create extended teacher education programs with yearlong internships in professional development schools and high-quality alternative pathways at the post-graduate level (e.g., MAT programs) for mid-career changers, retirees, and paraprofessionals.
- Work with local school districts to create more seamless, supported approaches to teacher entry and induction, including beginning teacher internships in professional practice schools.

Subject Matter Associations

Help states develop standards for teachers as well as students that reflect professionally recognized practices in your subject area.

- Advise states in collaborative efforts to develop reciprocity in licensing standards.
- Assist teacher education programs, mentors, and staff developers in applying subject matter standards to preservice curricula and advanced degree programs, induction programs, and professional development.
- Foster greater communication and understanding between education and arts and sciences faculties on the knowledge and skills teachers need to teach subject matter effectively.

Teachers' Unions

Work with school district officials to streamline hiring procedures and create recruitment policies that will assure qualified teachers, including minority teachers and teachers in shortage fields, for all schools.

- Review district policies and contract language for teacher hiring, evaluation, assignment, and continuation to assure that criteria are closely linked to professional teaching standards that are in turn aligned to student learning standards.
- Work with school district officials to develop induction programs for beginning teachers, incorporating internships in professional practice schools and mentoring through peer review and assistance programs.

- Work with school district officials to design district incentives, including forgivable loans, salary increments, and career ladders for paraprofessionals, that attract fully qualified teachers to teach in hard-to-staff fields and locations.
- Insist on equal enforcement of quality teaching standards for all students in the system, and develop fair and efficient procedures by which incompetent teachers will be assisted to improve and, when necessary, removed from teaching.

Parents, Community Members, and Business Representatives

Encourage the local media and community groups to survey school policies and practices on the hiring and assignment of qualified teachers for all children.

- Support district efforts to invest in intensive recruitment, improved personnel management capacity, incentives for hiring top-quality teachers, and beginning teacher induction programs.
- Ask about state and district capacities to project teacher supply and demand, and policies for recruiting and hiring adequate numbers of qualified teachers in all fields and locations.
- Support policies that will encourage schools of education to become professionally accredited and teachers to meet professional standards for teaching, such as INTASC and National Board standards.
- Insist on the enforcement of quality teaching standards for teachers of all students in every classroom in every school.

Will my child's teacher inspire her? Will he look after her individual needs? Will the teacher help my child learn all the necessary basic skills, as well as how to solve problems in the years ahead? Will my child's teacher be deeply knowledgeable about the subject she teaches and about the children she teaches as well?

It should be possible to answer the questions each parent worries about with a resounding "YES." With a concerted effort on the part of all of those who have a stake in our schools, it is possible for every child in each community to have access to a competent, caring, and qualified teacher every year in every subject area and every classroom. This, more than anything else, will make the major difference in what our children learn and what our nation becomes.

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Appendix

Basis for Cost and Attrition Estimates

Estimates for the relative costs of differently prepared "career teachers" (third year completers) were calculated as follows:

Program costs for preparation were calculated per 100 candidates and then added to costs per 100 candidates of recruitment, selection, hiring, and beginning teacher induction/ mentoring for only those who entered teaching.[1] That total cost was divided by the number of candidates per 100 entrants still in teaching by year three. This resulted in an estimated total cost per "career" (i.e., third year completer) candidate. Attrition rates were estimated based on data available from a variety of studies regarding different program models and from national data about beginning teacher attrition (see Chart 10).

Program costs for four-year programs were estimated at $6100 per year for three years or $18,300, based on NCES estimates of the average instructional FTE costs at public colleges and universities in 1996 dollars,[2] or $1,830,000 for 100 recruits. (This figure slightly overestimates costs, since a) most teacher education coursework occurs in the last two years of college and only a few courses are generally taken in freshman and sophomore years; and b) teacher education programs have generally been funded below the average for other college majors and programs.)

Entry into teaching was estimated at 70% based on national estimates for four-year program graduates and newly qualified teachers who are education majors or otherwise eligible to teach ranging from 63% to 80% (see Chart 10). Recruitment and beginning teacher induction costs for the estimated 70% hired would equal about $490,000 ($7000 x 70 recruits).

Continuation in teaching at year three was estimated at about 75% of entrants based on national estimates of survival rates generally ranging from 70% to 78% for four-year program graduates and teaching entrants. This rate is approximately equivalent to 53% of the cohort that had previously entered teacher education.

Thus, the cost per remaining recruit = $1,830,000 + $490,000 = $2,320,000 / 53 = $43,773 per third year teacher.

Program costs for five-year programs were estimated at $6100 per year for four years, (assuming an additional year beyond the estimate for undergraduate programs above) or $24,400. As above, the annual cost was based on NCES estimates of the average instructional FTE costs at public colleges and universities.[3] This sums to $2,440,000 for 100 recruits.

Entry into teaching was estimated at 90% based on national estimates for five-year program graduates (see Chart 10). Recruiting and beginning teacher induction costs for the estimated 90% hired would equal about $630,000 ($7000 x 90 recruits).

Continuation in teaching at year three was estimated at about 93% of those entering, or about 84% of the initial cohort, based on national estimates of survival rates of five-year program graduates (see Chart 10).

Thus, the cost per remaining recruit = $2,440,000 + $630,000 = $3,070,000 / 84 = $36,548 per third year teacher.

Program costs for short-term alternative certification programs were estimated at $10,000 in 1996 dollars, based on cost data from a number of programs.[8] This sums to $10,000,000 for 100 recruits.

Entry into teaching was estimated at 80% based on estimates of entry rates from various programs ranging from 54% to 90%, with modal rates between 70% and 90% (see Chart 10). Recruitment and beginning teacher induction costs for the estimated 80% hired would equal about $560,000 ($7000 x 80 recruits). Using the 80% figure underestimates the actual recruitment and induction costs for many district alternative certification programs that locate their major recruitment efforts before candidates are prepared rather than afterward.

Continuation in teaching at year three was estimated at about 34% of an initial cohort based on survival rates for various programs and entry pathways ranging from 28% to 40% (see Chart 10).

Thus, the cost per remaining recruit = $1,000,000 + $560,000 = $1,560,000 / 34 = $45,882 per third year teacher.

CHART 10

ATTRITION RATES (BY PATHWAY OR PROGRAM TYPE)

Program or program type	% completing training and entering teaching	% teaching at start of year 2	% teaching by year 3	% teaching in later years
Dallas Independent School District Alternative Certification program[5] (1986-87)	Best-case scenario = 73% (80 of 110 might complete training, if all of those who were held back due to deficiencies were to be successful)[6]			
Houston Alternative Certification program[7]	Best-case scenario = 71% (250 of 350 completed year 1 training; an unknown numbered entered teaching)			
Connecticut Alternate Route[8]	54 of 101 entered teaching in 1989 = 54%			
Los Angeles Teacher Trainee Program[9] (1984 cohort)	143 of 178 = 80.3 % completed training in year 1[10] 115 of 178 = 64.6% received a clear credential	105 of 178 = 58.9% were teaching at start of year 2	[Based on attrition trajectory, 40% teaching after 3 years]	47% of those who entered teaching (which was 64.6% of the initial cohort) remain by 1990 (year 6) = 30.3% of cohort[11]
Los Angeles Teacher Trainee Program[12] (1985 cohort)	104 of 129= 80.6% completed training		[Based on attrition trajectory, 37% teaching after 3 years]	52% of those who entered (64.8%) remain by 1990 (year 5) = 31.2% of cohort (assuming same entry rate as 1984)
Teach for America - Baltimore[13]	Approximately 90%		38% of entrants to teaching entered year 3 = 34% of cohort; based on national attrition trajectory, 28% would complete year 3	
Teach for America - New York City[14]	Approximately 90%		40% of entrants entered year 3 = 36% of cohort; based on national attrition trajectory, about 30% would complete year 3	
National data - Attrition of emergency or nonstandard certificate holders[15] (1991 entrants)		33% survive after one year	[Based on national attrition trajectory, < 29% of entering cohort would remain at year 3]	
National data - Entry rates of newly qualified teachers (1985)[16]	86% of 1985 NQTs applied to teach and 78% of those were teaching a year later = 67.1% of cohort (but 3-5% get jobs without applying, so net is approx. 70%)			

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CHART 10, continued

ATTRITION RATES (BY PATHWAY OR PROGRAM TYPE)

Program or program type	% completing training and entering teaching	% teaching at start of year 2	% teaching by year 3	% teaching in later years
National data – Entry rates of newly qualified teachers (1990)[17]	Of bachelors degree recipients in education in 1990, 73% were employed as educators in 1991			
National data – Entry rates of newly qualified teachers[18]	Of 1990 NQTs who were certified or eligible to teach, 83.2% were teaching a year later (p. 21). Of NQTs who were education majors, 78.4% were teaching (calculated from raw data)			
National data – Overall attrition[19] (Beginning teachers – years 1-3)			In 1987-88, about 24% attrition of a cohort after first 3 years; in 1990-91, about 23% after first 3 years; in 1993-94, about 22% after first 3 years (p. 5)	70% of a beginning cohort still teaching at 5 years
Four-year program graduates[20] (1985-90 graduates)	80%		[Based on national attrition trajectory, 70% of cohort still teaching after 3 years]	78% of those who entered in 1985-1990 still teaching in 1991-92 = 62.4% of cohort
Five-year program graduates[21] (1985-90 graduates)	90%		[Based on national attrition trajectory, 86% of cohort still teaching in year 3]	87% of those who entered in 1985-1990 still teaching in 1991-92 = 78.3% of cohort

[1]Costs of recruitment, selection, hiring, and beginning teacher induction/mentoring for those who entered teaching were estimated at $7,000 per candidate hired. This estimate was first offered by a personnel officer in a mid-sized city with access to detailed cost data and was checked against an informal survey of personnel officers conducted by the American Association of School Personnel Administrators, which produced estimates of the costs of hiring candidates and of the costs of beginning teacher induction. Excluding costs of induction, cost estimates for recruitment, screening, selection, and initial hiring ranged from $1,000 to $14,000 per candidate, depending on the market, costs of search and advertising, complexity of hiring procedures, and inclusion/exclusion of personnel costs for administrators and others involved in the search and selection procedures. Modal estimates for these functions ranged between $3500 and $4000 per candidate. Estimates for the cost of beginning teacher induction ranged from $1800 to $4000 and above. (Some could not put a precise price tag on what they called a "potentially staggering" cost.) Modal estimates were about $3,000. Based on these two components (recruitment, screening, selection, and hiring and induction), we use an estimate of $7,000 per candidate for the combined costs.

[2]In 1996 dollars, NCES estimated instructional (non-research) expenditures per FTE student at public colleges at $5477 annually and instructional expenditures at public universities at $6768 annually. The average of these two estimates is $6122. These costs were quite stable throughout the late 1980s and early 1990s (Smith et al., 1997, p. 174).

[3]In 1996 dollars, NCES estimated instructional (i.e. non-research) expenditures per FTE student at public colleges at $5477 annually and instructional expenditures at public universities at $6768 annually. The average of these two estimates is $6122. These costs were quite stable throughout the late 1980s and early 1990s (Smith et al., 1997, p. 174).

[4]In 1986, Adelman found average costs for alternative certification programs of $5000. In 1996 dollars, this average cost would be approximately $8,000. Most estimates do not include the costs of district administration, mentor teachers, or facilities, which would increase actual costs from $3,000 to $5,000 per recruit. In 1993, program costs for Teach for America were just over $12,000 per candidate (TFA Annual Report).

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[5]Lutz and Hutton, 1989.

[6]After one year 54% of interns (59 of 110) were prepared to enter teaching with certification (of these three more left after this calculation, putting the first-year completion rate at 50%); another 22% might be prepared by 1987-88 pending removal of deficiencies (of these at least one more had resigned after this calculation). Thus, the best-case scenario would yield 73% newly certified interns from the 1986 cohort (80 out of 110) (Lutz and Hutton, p. 251). Of 110, 11 dropped out in the first year (plus the four noted above, for 15 total), 15 were assigned another semester or year of internship, one was not recommended.

[7]Lutz and Hutton, 1989. This study also found that among those still in teaching at the end of year one, there were significant differences in plans to continue in teaching for traditionally prepared teachers (72% planning a long-term commitment) vs. alternative certification interns (40% planning a long-term commitment).

[8]Bliss, 1992.

[9]Data for 1984-86 from Wright, McKibbon, and Walton, 1987. Data for 1990 from Stoddart, 1992.

[10]Of 178 who entered the Los Angeles Teacher Trainee program in fall 1984, 35 left before completing it, a 20% dropout rate. Of the 143 who remained, 115 qualified for clear credentials because they completed the program satisfactorily. By fall 1986, 105 continued to serve as teachers in their districts. (58.9% were still there at start of second year.)

[11]Of those who actually entered teaching in 1984, 53% were gone by 1990; of those who entered in 1985, 48% were gone by 1990 (Stoddart, 1992, table 4).

[12]Of 129 who entered in fall of 1985, 25 had left by 1986, before completing the program. The "dropout rate" of 20% remained constant from the first group of trainees to the second (Wright, McKibbon, and Walton, 1987, p. 12).

[13]Maryland State Department of Education Data for 1992 cohort.

[14]New York City Board of Education Data for 1990 cohort.

[15]The Recent College Graduates Survey includes individuals who, though not eligible or certified to teach, nonetheless did so since their graduation a year earlier. About 19,000 of 140,000 "newly qualified teachers" (or about 15% of the total) fit this definition in 1991. By the time of the survey, however—one year after graduation—only one-third of these individuals (or 5% of all newly qualified teachers) were engaged in teaching as their primary job. Gray et al., 1993.

[16]Gray et al., 1993.

[17]Recent College Graduates Survey, 1991, as reported in Digest of Educational Statistics, 1993, p. 397.

[18]Choy et al., 1993; Gray et al., 1993.

[19]Henke et al., 1997.

[20]Andrew and Schwab, 1995. 80% of four-year program graduates in the 11-institution study (who graduated between 1985 and 1990) entered teaching. 78% of those who entered teaching were still teaching in 1991-92.

[21]Andrew and Schwab, 1995. 90% of extended (five-year) program graduates in the 11-institution study (who graduated between 1985 and 1990) entered teaching. 87% of those who entered teaching were still teaching as of the 1991-92 school year. In this study, extended program graduates were also significantly more likely to say they intended to be teaching in five years ($p < .01$).

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